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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/085,249

02/27/2002

John Giles Langan

06142 USA

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03/24/2004

AIR PRODUCTS AND CHEMICALS, INC.  
PATENT DEPARTMENT  
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EXAMINER

CHAUDHRY, SAEED T

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/085,249	LANGAN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Saeed T Chaudhry	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 8-15 is/are rejected.
- 7) ☒ Claim(s) 3-7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2-27-02</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) he has abandoned the invention.

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

(f) he did not himself invent the subject matter sought to be patented.

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

**Claims 1-2, 8 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by**

**Kubota et al.**

Kubota et al (US 2002/0134429 A1) disclose a method for recycle PFC gas mixture.

As for the processing gas to be employed in the cleaning of the interior of chamber, it is possible to employ a gas comprising a fluorine-containing gas and/or an oxygen-containing gas. Specific examples of such a processing gas include CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>3</sub>F<sub>8</sub>, C<sub>4</sub>F<sub>10</sub>, C<sub>5</sub>F<sub>8</sub>O, F<sub>2</sub>, NF<sub>3</sub>, O<sub>2</sub>, etc. A mixed gas comprising two of more kinds of these gases may be also employed. Further, an inert gas such as N<sub>2</sub>

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or Ar may be incorporated in these processing gases. For example, a mixed gas comprising C.sub.2F.sub.6, O.sub.2 and N.sub.2 may be preferably employed as a processing gas.

The chamber 11 is connected with a pressure-adjusting valve 14, so that the pressure inside the chamber 11 can be maintained approximately constant by the adjustment of the opening degree of the valve 14. The chamber 11 is connected, through the gas outlet end thereof, with a gas circulating exhaust unit 15 with which an exhaust unit 16 for discharging the gas outside the system is connected. As for the exhaust unit 15, a turbo-molecular pump or a Roots pump can be employed. As for the exhaust unit 16, a dry pump can be employed.

A back-pressure adjusting valve 17 for the exhaust unit 15 is interposed between the exhaust unit 15 and the exhaust unit 16. A piping 18 disposed on the gas outlet side of the exhaust unit 15 is diverged at the branch point 19 thereof into a piping 20 communicated with the exhaust unit 16 and a gas circulating piping 21, so that the ratio of gas to be circulated relative to the quantity of gas to be discharged by the exhaust unit 15, i.e. gas circulating ratio, can be controlled by adjusting the opening degree of the back-pressure adjusting valve 17. By the way, in the case where the deposition of film is to be performed inside the chamber 11, the back-pressure adjusting valve 17 is controlled so as to be fully opened. Since the gas circulating piping 21 is connected at a confluence point 22 with a gas supply piping 23 and also with a gas feeding piping 24, the processing gas being fed from the gas circulating piping 21 (the processing gas to be recycled) is enabled to combine with the processing gas to be fed from the gas supply piping 23 (the processing gas to be supplied from the ordinary gas source) at the confluence point 22, the resultant mixed processing gas being introduced via the gas feeding piping 24 into the chamber 11. A valve 25 (for example, stop valve) is installed at a midway of

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the gas circulating piping 21 so as to enable the back-pressure of the gas circulating exhaust unit 15 to be set higher than the pressure of gas confluence point 22 under the condition where this valve 25 is opened during the circulation of gas. By the way, during the film-forming process, The reference discloses to use mixture of  $\text{CF}_4$  and  $\text{C}_2\text{F}_6$  and  $\text{O}_2$  as a influent gas and recirculating 80% of the used gas back into the chamber by adding in the influent stream at 22 to create a third gas mixture. The amount of  $\text{CF}_4$  and volume in the effluent would inherently equal to the mount of the influent since Kubota et al use  $\text{CF}_4$  and  $\text{C}_2\text{F}_6$ . Therefore, Kubota et al anticipate the claimed process.

### **Claim Rejections - 35 USC § 103**

**The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:**

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over**

**Kubota et al.**

Kubota et al were discussed supra. However, the reference fails to disclose that first ratio of  $\text{CF}_4$  to  $\text{C}_2\text{F}_6$  greater than or equal to 1.

It would have been obvious at the time applicant invented the claimed process to manipulate the ratio of the PFC gas mixture because Kubota et al disclose to use mixture of the  $CF_4$  and  $C_2F_6$  in the cleaning process of the CVD chamber and one would manipulate the ratio for the purpose of better and efficient results. Further one of ordinary skill in the art would expect that by increasing flow rate of any one of the gas would change the ratio of the gas.

#### **Allowable Subject Matter**

Claims 3-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### **Reasons For Allowable Subject Matter**

The following is an Examiner's statement of reasons for the indication of allowable subject matter:

None of the prior art discloses or suggests third ratio of  $CF_4$  to  $C_2F_6$  is less than or equal to about 0.32 or third ratio of  $CF_4$  to  $C_2F_6$  is greater than or equal to 1 and the first ratio of  $CF_4$  to  $C_2F_6$  is selected based on the third ratio of  $CF_4$  to  $C_2F_6$ .

*Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (571) 272-1298. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 4:00 P.M.*


*If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Randy Gulakowski, can be reached on (571)-272-1302. The fax phone number for non-final is (703)-872-9306.*

*When filing a FAX in Gp 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are for entry into the file of the application. This will expedite processing of your papers.*

*Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1700.*

**Saeed T. Chaudhry**

Patent Examiner  
March 10, 2004

  
FRANKIE L. STINSON  
PRIMARY EXAMINER  
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